Dynamic Circuit Thermal Line Rating (DCTR)

Contract #: 500-97-011 **Project #:** 5
Contractor: San Diego Gas and Electric Company
Project Amount: $110,000
Contractor Project Manager: William Torre (858) 654-8349
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Status: Completed

Project Description:
The purpose of this project was to develop and demonstrate real-time transmission line ratings. DCTR uses equipment mounted on a transmission tower to monitor the line conductor tension and determine ground clearances and weather conditions to calculate the amount of current that can be transmitted in real time. This information is provided to system operators or engineers for their use in safe, reliable and economic system operation. Conventional transmission lines ratings have been established as static rating, which may be lower than the maximum capability of the conductor. By monitoring wind speed, conductor tension and solar heating, a real time line rating may be calculated that is closer to the maximum conductor capability.

This project supports the PIER Program objectives of:

- Improving the reliability/quality of California's electricity since using real time dynamic line ratings ensures reliability and quality by making sure that ground clearances are not exceeded thus avoiding contact and flashovers which cause power outages and voltage surges.
- Improving the energy cost/value of California's electricity by improving transmission line utilization to facilitate economic transactions and reduce costs as real time ratings allow greater power transfers on existing facilities than the static line rating.
- Improving the environmental and public health costs/risks of California's electricity by improving utilization of existing transmission lines thereby avoiding the need for new lines and the associated environmental impacts.
- Improving the safety of California's electricity by using real time information to make certain that ground clearance limits are not exceeded thus avoiding the risk of electrical shock and fires.

Proposed Outcomes:

1. Increase transmission capacity on congested transmission lines to allow increased power transfers.
2. Reduce use of expensive generators which "must run" due to transmission rating constraints.
3. Promote the use of more economic generators to result in reduced energy system price for utility customers.

Actual Outcomes:

1. The dynamic real time rating for the demonstration was up to 150 percent more than the normal rating at some times. From 9 a.m. through 5 p.m., the dynamic rating averaged a 75 percent increase in rating over the normal rating on that circuit.
2. The real time rating also indicates that line ratings are sometimes reduced, and eliminates the risk of sagging the conductor to the point of contact thus preventing danger to the public.

Project Status:
The project has been completed. For the final report, please right click on
www.energy.ca.gov/pier/final_project_reports/600-00-036.html